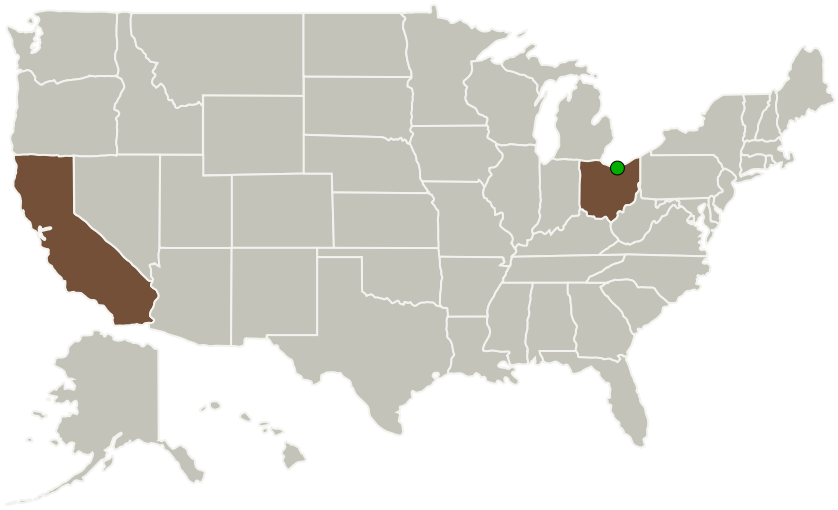
A Novel, Portable, Projection, Focusing Schlieren System, Phase I

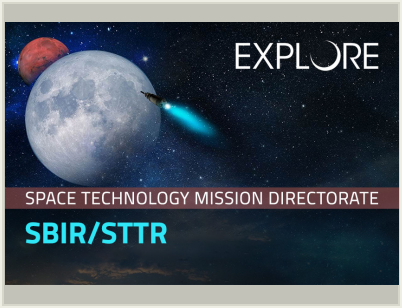
Completed Technology Project (2010 - 2010)

Project Introduction

The schlieren technique has been used for flow diagnostics in wind tunnels since the beginning of aerospace research, due to its ability to make airflows ⬌ especially shock waves and turbulence ⬌ visible. This proposal describes a novel type of schlieren system that would increase efficiency, capability, and productivity for ground test facilities. The concept and the availability of state of the art components make the system more portable, easier to align, and more versatile than existing systems. A major drawback of current schlieren systems and one that has restricted their widespread commercial use is that they require exact alignment between a pair of widely separated mirrors or grids, which takes time and limits portability, and costs are prohibitive for most such applications. This problem is partially relaxed by focusing schlieren methods. The proposed concept incorporates features of existing schlieren systems while removing the primary limitations. All of the elements that require precise alignment are contained within a camera body and can be relatively inexpensive. Also, very large fields of view are made possible. This is advantageous in wind tunnel facilities, since experiments are frequently installed only to be torn down shortly afterwards.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
MetroLaser, Inc.	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Laguna Hills, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139958)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MetroLaser, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

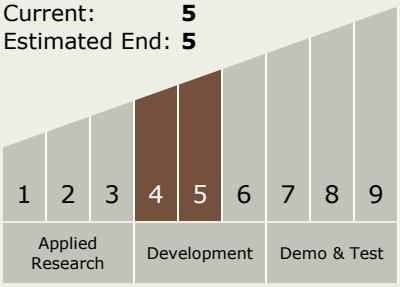
Carlos Torrez

Principal Investigator:

Drew L'esperance

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.2 Test and Qualification
    - TX13.2.1 Mechanical/Structural Integrity Testing

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System